

HIGH RAP HMA

CONTRACTOR'S PERSPECTIVE
PRESENTED BY:
PAUL SCHIFANO

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SCHIFANO CONSTRUCTION CORP

- Villanova University '07
- Worked in Finance for 2 years after graduation
- Joined Schifano Construction Corp. in 2009
 - VP of Operations
 - Manage all projects/construction related activities for Schifano Construction Corp.
 - Have managed over 15 NJDOT projects
- Father of 2 beautiful girls
 - Eleanor – 3 Years
 - Sloane – 2 Months



MRRC CONTRACT N104

ROUTES 15, 23 AND 94 IN SUSSEX COUNTY

- Bid Date: 12/12/13
- Award Date: 2/7/14
- Original Completion Date: 9/26/14
- Locations
 - **15** - MP 14.22 – 17.02 / Sparta & Lafayette Township / Sussex County
 - **23** - MP 49.76 – 52.57 / Montague Township / Sussex County
 - **94** - MP 32.84 – 35.41 / Hardyston Township / Sussex County
- Specification: Mill roadway surface to depth of **2”** and resurface with **2”** thick
 - NB Lanes – HMA 12.4M64 Surface Course High Rap – **13,337 Tons**
 - SB Lanes – HMA 12.5M64 Surface Course – **16,706 Tons**
- Supplier:
 - Tilcon – Mt Hope



PERCEPTION OF HIGH RAP



- When bidding the project
 - Knew Tilcon did not have a mix approved
 - Tilcon assured us they would be able to produce a passing material
 - We had confidence bidding the project that even though this was a new mix, we would be able to install within specification
- Possible perception of a High Rap mix
 - Will a High Rap mix be tougher to get compaction?
 - One of the first things we do when we have issues getting compaction numbers on another project is to call the plant and check the RAP content and if we need to “tighten” the mix
 - Will there be a noticeable aesthetic difference in the mix?

HOW TO PREPARE FOR HIGH RAP PROJECT?

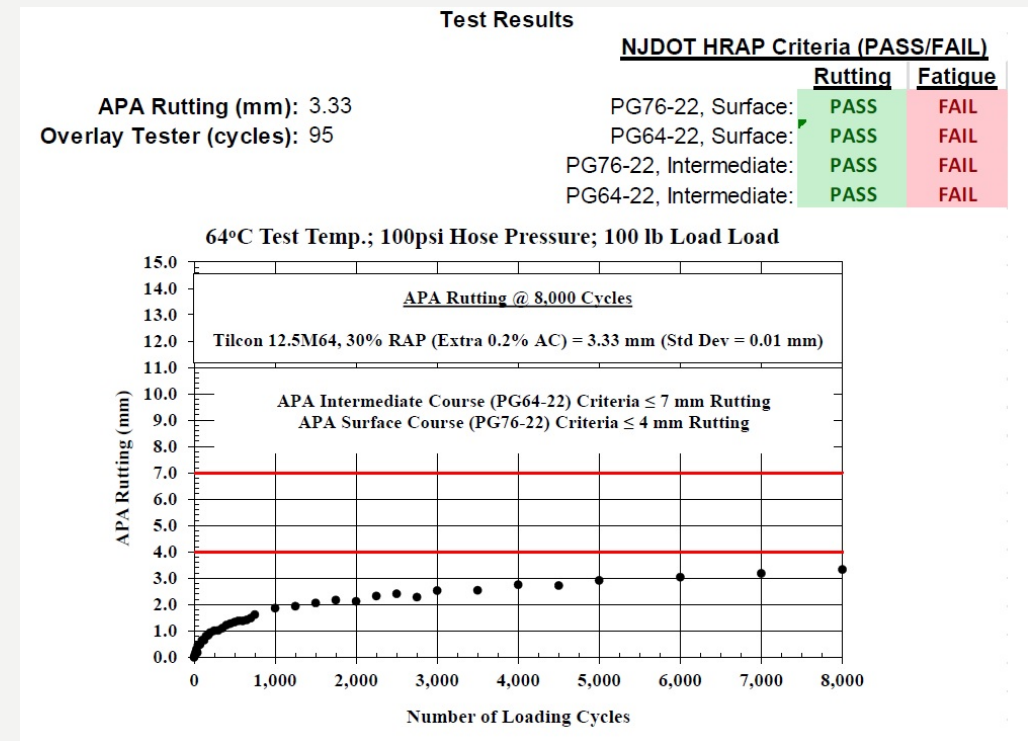


- This was our first project using a High Rap Mix so we did research and due diligence necessary to put our company in the best possible position to have a successful project
- What we wanted to know:
 - Any specific rolling patterns?
 - Specific temperatures required for production or lay down?
 - Workability of Material?
 - Difficulties with achieving compaction?
 - Anticipated production (tons/hour)?
- Reached out to Industry Experts and Contractors with High Rap expertise and experience
- Reaction we got from everyone we contacted:
 - Treat this mix like any other 64 oil mix
 - Should have no issues achieving compaction
 - Basically – Business as usual

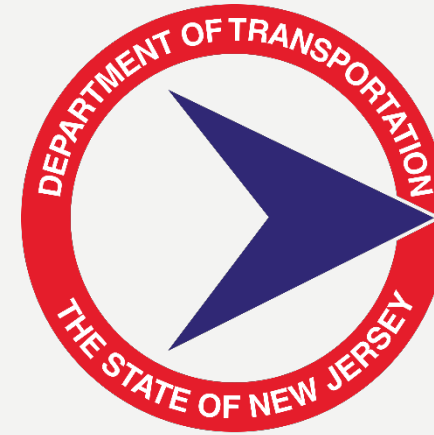
TIMELINE

- Project was originally scheduled to be paved in Summer of 2014, with a completion date of 9/26/14
- Completed all necessary preceding work in June/July 2014 anticipating paving soon after, pending approval of High Rap Mix
- After failing tests in June and July, we requested a meeting with NJDOT to discuss an extension of time
 - Even if approved by August/September, we realized the earliest paving could be completed was late October, with striping still to follow

Failed Test Result from 5/29/14



MEETING WITH NJDOT



- Met with NJDOT Region North in September 2014
- NJDOT was reluctantly sympathetic to our issues
 - NJDOT especially reluctant because they had another High Rap project going on at the same time, being supplied out of another plant, that had obtained approval for their High Rap mix (a 9.5M64 High Rap Mix)
 - From our perspective, it seemed that NJDOT was losing patience with Tilcon, feeling they were not making enough adjustments each time they submitted another mix design
 - Approval issue became an issue being dealt between Tilcon and NJDOT (and not a Schifano Construction issue)
 - Tilcon (Rich Linton) remained optimistic every time they submitted material for approval; we grew more pessimistic after every failed test
 - Every failed test took another 3-4 weeks before getting another result – we were running out of time
 - Completion date of 9/26
 - Even if test passed soon after – pushed our schedule for completion December with paving (in Sussex County at night) into November and Striping after that
 - Given an extension of time until the Spring of 2015
- At the same time, Tilcon was adding the rejuvenator to the mix, which passed in early September
- Paving was scheduled for April 2015
- First, we had to do a Test Strip (not in the first night's production) because of the issues to get the mix approved

TEST STRIP

- Paved our test strip on another NJDOT project - Maintenance Resurfacing Contract No. 518
 - Had 10 WIM Sites to Pave statewide under contract in early Spring 2015
 - All approx. 200-400 tons each
 - RE from contract approved using WIM Site on US-22 in Mountainside
 - Installed 12.5M64 High Rap (30%) and also used as our Test Strip for MRRC N104
 - Great example of NJDOT working together to help resolve this issue
- Technician's Notes (Advanced Testing)
 - Target air voids for cores 2 to 8%, said plant had target air voids of 1.5 to 5%
 - Numbers popped quickly, at 190F compaction and was verified with correlation core at 95.4%
- Equipment
 - Paver – CAT AP1055e
 - Breakdown Roller – Hamm HD120 OSC
 - Intermediate Roller – IR DD118 (Static Only)



TEST STRIP RESULTS

- Air voids for 5 Test Strip Cores:
 - 5.2
 - 4.7
 - 5.5
 - 4.8
 - 5.0
- Average 5.0
- Passed! Smooth sailing from here.. Or at least as smooth as an NJDOT project can be



TILCON TECHNICAL CENTER
IN PLACE AIR VOID ANALYSIS

Mix: 12.5M64 Producer: Tilcon Mt. Hope Date of Paving: 4/14/2015
 Weather: Contractor: Schifano Date of Coring: 4/14/2015
 Project: Rt 15 Test Strip

Maximum Specific Gravity = 2.505

| | 1 | 2 | 3 | 4 | 5 |
|-------------------------------|--------|--------|--------|--------|--------|
| 1. Weight in Air | 2479.0 | 2089.6 | 2303.6 | 2348.4 | 2542.3 |
| 2. Weight at S.S.D. | 2480.9 | 2090.9 | 2306.1 | 2348.8 | 2544.1 |
| 3. Weight in Water | 1437.1 | 1215.8 | 1332.7 | 1364.5 | 1476.3 |
| 4. 2 - 3 | 1043.8 | 875.1 | 973.4 | 984.3 | 1067.8 |
| 5. Gmb = 1 / 4 | 2.375 | 2.389 | 2.369 | 2.388 | 2.371 |
| 6. Air Voids | 5.2 | 4.7 | 5.5 | 4.8 | 5.0 |
| % Compaction | 94.8 | 95.3 | 94.5 | 95.2 | 95.0 |
| Unit weight | 148.2 | 149.0 | 147.7 | 148.9 | 148.6 |
| Field Values Gauge | 143.9 | 146.4 | 143.7 | 145.9 | 145.2 |
| Field Values Air Voids | 8.1 | 6.3 | 8.1 | 6.7 | 7.1 |
| Gauge Difference Gauge G50 | 2.9 | 1.6 | 2.6 | 1.9 | 2.1 |
| Core Height | 2.29" | 1.98" | 2.18" | 2.24" | 2.34" |
| | | | | | |
| | | | | | |

Average Gmb.: 2.379 Average Voids: 5.0

| | |
|--------------------------|-------|
| Unit Wt. | 148.5 |
| YD ² 1" Thick | 111.3 |

MRRC N104 IRI ANALYSIS

- IRI Target
 - 23 – 79
 - 94 – 73
 - 15 – 67
- By using same paving practices for both NB and SB Lanes, we were able to bonus lanes with High Rap and without changing paving practices or equipment

| Route | Target IRI | NB – 12.5M64 (HR) | SB – 12.5M64 |
|-------|------------|-------------------------|-----------------|
| 23 | 79 | 57 | 51 |
| 94 | 73 | 54 | 60 |
| 15 | 67 | 55 | 55 |

MRRC N104

AIR VOID DENSITY ANALYSIS

- Air Void Requirements
 - Between **2%-8%**
- Similar to the IRI data, the Air Void Results from the project also showed a negligible difference
- Over 30,000 tons installed on the entire job



| Mix | Average Density |
|------------------|-----------------|
| 12.5M64 | 5.98 |
| 12.5M64 High Rap | 5.88 |

15

Lafayette Rd

Exit Street View



NB
HIGH RAP

SB

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41°05'19.72" N 74°40'36.28" W elev 0 ft eye alt 8 ft

94

3362 NJ-94



 Exit Street View






 COMMERCIAL
FOR SALE
 \$1,200,000

WB
 HIGH RAP

EB

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23

44 NJ-23



Exit Street View

SB

NB
HIGH RAP

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41°20'42.76" N 74°40'37.78" W elev

Friday, January 27, 2017

CONCLUSION

- No visual difference
- No production issues
- Very workable mix (similar to any other 64 oil mix)
- Durable – Still can not tell difference between 12.5M64 Mix and 12.5M64 High Rap Mix used on 15, 23 and 94 after installation 3 years ago
- Toughest part of the project was getting approval and scheduling paving
- If proven to be a durable product, High Rap mixes can be major positive to the state of New Jersey to start aggressively recycling our abundance of millings
- Thank you!